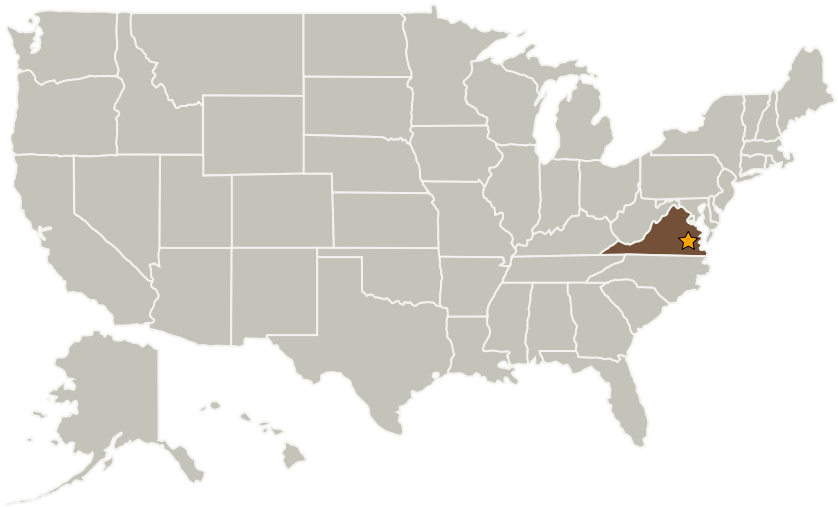
Wake Vortex Lidar Monte Carlo Simulation and Visualization Tool, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

Light Detection and Ranging (LIDAR) sensors have been successfully demonstrated and implemented capabilities to detect and measure wake vortices in and around the terminal area. Although LIDAR systems have been used to measure wake vortex strength and position in NASA and FAA measurement campaigns and too little is known about their accuracy in quantifying location and strength in different regimes. Field data analysis suggests that strength may be commonly overestimated compared to theoretical models, but no study has been conducted to determine the validity and accuracy of the sensing techniques to determine these estimates. Additionally, these uncertainties cannot be determined since no other remote sensing system has been verified to accurately measure and characterize the wake vortices. A risk with no quantitative assessment is that it may negatively impact the separation standards. Aerospace Innovations, LLC proposes to design and develop a physics-based Monte Carlo LIDAR Simulation and Visualization (LiSiVi) Tool to provide NASA and industry researchers the ability to accurately model the performance of LIDAR based wake vortex sensing systems. The significance of this innovation is that it combines the advancement of knowledge in the wake vortex modeling research and the laser technology areas.

Primary U.S. Work Locations and Key Partners



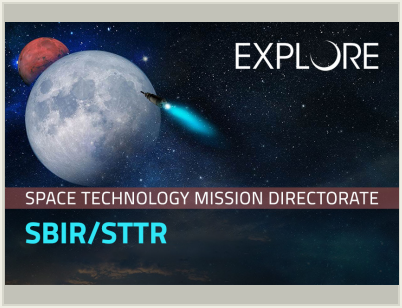


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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Aerospace Innovations, LLC	Supporting Organization	Industry	Yorktown, Virginia

Primary U.S. Work Locations
Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
  - TX16.2 Weather/Environment